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SAF-D05-002
RCBRA Tribal Plant Sampling –
Other Solid
FINAL VALIDATION PACKAGE

MAIL VALIDATION PACKAGE TO:

Steve Weiss H0-23

mjp 8-4-05
INITIAL/DATE

SDG W04625

SAF-D05-002

RECEIVED
AUG 22 2005
EDMC

Date: 8 June 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: RCBRA Tribal Plant Sampling - Other Solid
Subject: Radiochemistry - Data Package No. W04625

INTRODUCTION

This memo presents the results of data validation on Data Package No. W04625 prepared by Severn Trent. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J031H8	4/19/05	Solid	C	See note 1 & 2
J031H9	4/19/05	Solid	C	See note 1
J031J0	4/19/05	Solid	C	See note 1
J031J2	4/19/05	Solid	C	See note 1
J031J4	4/19/05	Solid	C	See note 1
J031J6	4/20/05	Solid	C	See note 1
J031J8	4/20/05	Solid	C	See note 1 & 2
J031J9	4/20/05	Solid	C	See note 1
J031K0	4/20/05	Solid	C	See note 1
J031K2	4/20/05	Solid	C	See note 1
J031K4	4/20/05	Solid	C	See note 1

1 - Gamma spectroscopy, alpha spectroscopy (isotopic uranium), total strontium.

2 - No gamma spectroscopy analysis due to lack of sufficient material.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the RCBRA (BHI-01754, March 2005). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Data Requested by Client

000001

DATA QUALITY PARAMETERS

- Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

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Due to the lack of an LCS analysis, all uranium-235 results were qualified as estimates and flagged "J".

Due to the lack of a cobalt-60 LCS analysis, all gamma spectroscopy results (except cesium-137) were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

- **Field Duplicates**

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. Fifty-two analytes were reported above their RQL. Under the BHI statement of work, no qualification is required. All other reported results met the analyte specific RQL.

- **Completeness**

Data package No. W04625 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). Due to the lack of gamma spectroscopy analysis in samples J031H8 and J031J8 the completion percentage was 87%.

000003

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of an LCS analysis, all uranium-235 results were qualified as estimates and flagged "J". Due to the lack of an LCS analysis, all gamma spectroscopy results (except cesium-137) were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Fifty-two analytes were reported above their RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01754, *Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the River Corridor Baseline Risk Assessment*, March 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- U** - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ** - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J** - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R** - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR** - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

000007

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: W04625	REVIEWER: TLI	PROJECT: RCBRA	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Uranium-235 All gamma spectroscopy analytes except cs-137	J	All	No LCS analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: BECHTEL-HANFORD																				
Laboratory: STL																				
Case																				
Sample Number		J031H8		J031H9		J031J0		J031J2		J031J4		J031J6		J031J8		J031J9		J031K0		
Remarks																				
Sample Date		4/19/05		4/19/05		4/19/05		4/19/05		4/19/05		4/20/05		4/20/05		4/20/05		4/20/05		
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Americium-241	0.3	NA		0.0202	UJ	0.0447	UJ	0.0304	UJ*	-0.0275	UJ*	0.0373	UJ	NA		0.0252	UJ	0.0797	UJ	
Cobalt 60	0.05	NA		-0.0227	UJ	-0.00578	UJ*	0.0208	UJ*	0.0197	UJ*	0.0255	UJ*	NA		0.00970	UJ	0.0557	UJ*	
Cesium 137	0.1	NA		0.0266	U	-0.0260	UJ*	0.0768	U	0.000801	U	0.0133	U*	NA		0.0775		0.00119	U*	
Europium 152	0.1	NA		0.0116	UJ*	-0.0237	UJ*	0.0201	UJ*	0.0434	UJ*	0.0292	UJ*	NA		0.107	UJ*	-0.0215	UJ*	
Europium 154	0.1	NA		-0.0833	UJ*	0.122	UJ*	-0.0341	UJ*	0.0564	UJ*	0.0351	UJ*	NA		-0.00885	UJ*	-0.159	UJ*	
Europium 155	0.1	NA		-0.0413	UJ	-0.0193	UJ*	0.0278	UJ*	-0.0210	UJ*	0.00457	UJ*	NA		0.0193	UJ	0.0205	UJ*	
Radium-226	0.1	NA		0.176	UJ	-0.0386	UJ*	0.0505	UJ*	0.134	UJ*	-0.140	UJ*	NA		0.244	UJ	-0.0163	UJ*	
Radium-228	0.2	NA		0.126	UJ	0.150	UJ*	0.0995	UJ*	0.303	UJ*	-0.276	UJ*	NA		0.123	UJ	-0.0665	UJ*	
Thorium-228	0.2	NA		0.115	UJ	0.176	UJ*	0.0142	UJ*	0.299	UJ*	0.0321	UJ*	NA		0.102	UJ	-0.142	UJ*	
Thorium-232		NA		0.124	UJ	-0.183	UJ	0.0148	UJ	0.0339	UJ	0.455	UJ	NA		0.0968	UJ	0.305	UJ	
Uranium-234	1	0.0747		0.178		0.0904	U	0.201		0.0631		0.0549		0.0748		0.157		0.0669		
Uranium-235	1	0.00305	UJ	0.00671	J	0.00283	UJ	0.00423	J	0.000902	UJ	0.00163	UJ	0.00156	UJ	0.00684	UJ	0.000265	UJ	
Uranium-238	1	0.120		0.153		0.0959		0.642		0.0628		0.140		0.0554		0.272		0.100		
Strontium-89/90	1	0.378		0.222		0.149		0.394		0.146	U	0.198	U	0.259		0.401		0.177	U	
Sample Number		J031K2		J031K4																
Remarks																				
Sample Date		4/20/05		4/20/05																
Radiochemistry	RQL	Result	Q	Result	Q															
Americium-241	0.3	-0.0143	UJ	0.0113	UJ															
Cobalt 60	0.05	-0.0364	UJ*	0.00538	UJ															
Cesium 137	0.1	0.0417	U*	0.0172	U															
Europium 152	0.1	0.0129	UJ*	0.0278	UJ															
Europium 154	0.1	0.162	UJ*	-0.000466	UJ*															
Europium 155	0.1	0.0247	UJ*	0.0206	UJ															
Radium-226	0.1	-0.110	UJ*	0.139	UJ															
Radium-228	0.2	-0.0801	UJ*	0.0774	UJ															
Thorium-228	0.2	-0.232	UJ*	0.0588	UJ															
Thorium-232		0.534	UJ	0.0218	UJ															
Uranium-234	1	0.0396		0.0937																
Uranium-235	1	0.00220	UJ	0.00350	UJ															
Uranium-238	1	0.0996		0.233																
Strontium-89/90	1	0.135	U	0.251		NA - Not analyzed														

* - RQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland
 Lot-Sample No.: J5D250202-6
 Client Sample ID: J031H8

SDG: W04625A
 Report No.: 28888
 COC No.:

Collection Date: 4/19/2005 1:00:00 PM
 Received Date: 4/25/2005 11:40:00 AM
 Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count	Total	MDC MDA,	Rpt Unit,	Yield	Rst/MDC,	Analysis,	Total Sa	Aliquot	Primary
			Error (2 s)	Uncert(2 s)	Action Lev	Lc	CRDL(RL)	Rst/TotUncert	Prep Date	Size	Size	Detector
Batch: 5116487	RICHRC5079				Work Order: G85KK1AA		Report DB ID: 9G85KK10					
U-234	7.47E-02		1.5E-02	2.0E-02	6.44E-03	pCi/g	88%	(11.6)	5/14/05 10:35 p		2.01	ALP7
					2.28E-03		2.00E-02	(7.4)			G	
U-235	3.05E-03	U	3.7E-03	4.1E-03	5.10E-03	pCi/g	88%	0.6	5/14/05 10:35 p		2.01	ALP7
					1.61E-03		2.00E-02	(1.5)			G	
U-238	1.20E-01		1.9E-02	2.7E-02	7.46E-03	pCi/g	88%	(16.1)	5/14/05 10:35 p		2.01	ALP7
					2.79E-03		2.00E-02	(9.)			G	

Ratio U-234/238 = 0.6

No. of Results: 3 Comments:

ET100000

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
 1613 A97

FORM I
SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland

Lot-Sample No.: J5D250202-7

Client Sample ID: J031H9

SDG: W04625A

Report No.: 28888

COC No.:

Collection Date: 4/19/2005 1:00:00 PM

Received Date: 4/25/2005 11:40:00 AM

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unl, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116487	RICHRC5079				Work Order: G85KL1AA			Report DB ID: 8G85KL10				
U-234	1.78E-01		2.2E-02	3.6E-02	1.75E-03 pCi/g		91%	(101.7)	5/14/05 10:36 p		2.01	ALP8
U-235	6.71E-03		4.7E-03	5.1E-03	4.76E-03 pCi/g		91%	(1.4)	5/14/05 10:36 p		2.01	ALP8
U-238	1.53E-01		2.0E-02	3.2E-02	1.75E-03 pCi/g		91%	(87.5)	5/14/05 10:36 p		2.01	ALP8
							1.51E-03	2.00E-02	(2.6)			G
								2.00E-02	(9.7)			G

Ratio U-234/238 = 1.2

No. of Results: 3 Comments:

10000
1000
100
10

JK
6/14/05

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRichSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
 4413 A97

STL RICHLAND

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625A

Collection Date: 4/19/2005 11:00:00 PM

Lot-Sample No.: JSD250202-8

Report No.: 28888

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031J0

COC No.:

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Count Qual	Count Error (2 s)	Total Uncert(2 s)	MDC(MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 5116487	RICHRC5079				Work Order: G85KM1AA		Report DB ID: 9G85KM10					
U-234	9.04E-02		1.6E-02	2.2E-02	4.77E-03	pCi/g	94%	(19.)	5/14/05 10:36 p		2.02	ALP9
					1.51E-03		2.00E-02	(8.2)			G	
U-235	2.83E-03	U	2.9E-03	3.4E-03	1.75E-03	pCi/g	94%	(1.6)	5/14/05 10:36 p		2.02	ALP9
							2.00E-02	(1.7)			G	
U-238	9.59E-02		1.6E-02	2.2E-02	4.77E-03	pCi/g	94%	(20.1)	5/14/05 10:36 p		2.02	ALP9
					1.51E-03		2.00E-02	(8.6)			G	

Ratio U-234/238 = 0.9

No. of Results: 3 Comments:

5/14/05

C:\0000

FORM I
SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland

Lot-Sample No.: J5D250202-9

Client Sample ID: J031J2

SDG: W04625A

Report No.: 28888

COC No.:

Collection Date: 4/19/2005 2:00:00 PM

Received Date: 4/25/2005 11:40:00 AM

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count	Total Uncert(2 s)	MDC MDA	Rpt Unit,	Yield	Rst/MDC,	Analysis,	Total Sa	Aliquot	Primary
					Action Lev	Lc	CRDL(RL)	Rst/TotUncert	Prep Date	Size	Size	Detector
Batch: 5116487	RICHRC5079				Work Order: G85KN1AA		Report DB ID: 9G85KN10					
U-234	2.01E-01		2.3E-02	4.0E-02	4.88E-03	pCi/g	92%	(41.1)	5/14/05 10:36 p	2.01	G	ALP10
U-235	4.23E-03	1	3.5E-03	3.9E-03	1.80E-03	pCi/g	92%	(2.4)	5/14/05 10:36 p	2.01	G	ALP10
U-238	6.42E-01		4.1E-02	1.1E-01	1.80E-03	pCi/g	92%	(357.2)	5/14/05 10:36 p	2.01	G	ALP10
								2.00E-02	(11.7)			

Ratio U-234/238 = 0.3

No. of Results: 3 Comments:

SCOTT
RICH

Y
6/6/05

STL Richland
rp(STLRchSample
V613 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625A

Collection Date: 4/19/2005 2:10:00 PM

Lot-Sample No.: J5D250202-10

Report No.: 28888

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031J4

COC No.:

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count	Total	MDC MDA,	Rpt Unit,	Yield	Rst/MDC,	Analysis,	Total Sa	Alliquot	Primary
			Error (2 s)	Uncert(2 s)	Action Lev	Lc	CRDL(RL)	Rst/TotUncert	Prep Date	Size	Size	Detector
Batch: 5116487	RICHRC5079				Work Order: G85KP1AA		Report DB ID: 9G85KP10					
U-234	6.31E-02		1.3E-02	1.8E-02	4.81E-03 pCi/g		83%	(13.1)	5/14/05 10:37 p		2.05	ALP11
						1.52E-03	2.00E-02	(7.1)			G	
U-235	9.02E-04 U	1	2.6E-03	3.1E-03	4.81E-03 pCi/g		83%	0.19	5/14/05 10:37 p		2.05	ALP11
						1.52E-03	2.00E-02	0.59			G	
U-238	6.28E-02		1.3E-02	1.7E-02	1.77E-03 pCi/g		83%	(35.5)	5/14/05 10:37 p		2.05	ALP11
						2.00E-02	(7.6)				G	

Ratio U-234/238 = 1.0

No. of Results: 3 Comments:

S2000

*R**C/u ok*

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

rpSTLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

V13 A97

STL RICHLAND

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625A

Collection Date: 4/20/2005 10:00:00 AM

Lot-Sample No.: J5D250202-2

Report No.: 28888

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031J6

COC No.:

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Count Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector	
Batch: 5116487	RICHRC5079				Work Order: G85KE1AA		Report DB ID: 9G85KE10						
U-234	5.49E-02		1.2E-02	1.6E-02	1.84E-03	pCi/g	91%	(29.8)	5/14/05 10:33 p		2.01	ALP2	
U-235	1.63E-03	U	3.6E-03	4.0E-03	6.32E-03	pCi/g	91%	2.00E-02	(6.7)		G		
U-238	1.40E-01		2.0E-02	3.0E-02	5.01E-03	pCi/g	91%	2.24E-03	2.00E-02	0.26	5/14/05 10:33 p	2.01	ALP2
								1.58E-03	2.00E-02	0.82		G	
									5/14/05 10:33 p		2.01	ALP2	
											G		

Ratio U-234/238 = 0.4

No. of Results: 3 Comments:

370000

W
6/6/05

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625A

Collection Date: 4/20/2005 9:00:00 AM

Lot-Sample No.: J5D250202-11

Report No.: 28888

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031J8

COC No.:

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count	Total Uncert(2 s)	MDC MDA	Rpt Unit	Yield	Rst/MDC,	Analysis,	Total Sa	Allotqu	Primary
					Action Lev	Lc	CRDL(RL)	Rst/TotUncert	Prep Date	Size	Size	Detector
Batch: 5116487	RICHRC5079				Work Order: G85KR1AA		Report DB ID: 9G85KR10					
U-234	7.48E-02		1.4E-02	2.0E-02	1.79E-03	pCi/g	93%	(41.9)	5/14/05 10:37 p	2.0	G	ALP12
U-235	1.56E-03	U	2.9E-03	3.4E-03	4.85E-03	pCi/g	93%	0.32	5/14/05 10:37 p	2.0	G	ALP12
U-238	5.54E-02		1.2E-02	1.5E-02	4.85E-03	pCi/g	93%	(11.4)	5/14/05 10:37 p	2.0	G	ALP12
							1.53E-03	2.00E-02				
							1.53E-03	2.00E-02				

Ratio U-234/238 = 1.4

No. of Results: 3 Comments:

10000
1000
100
10✓
6/6/03

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rplSTLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
 06/13 A97

STL

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625A

Collection Date: 4/20/2005 9:00:00 AM

Lot-Sample No.: J5D250202-1

Report No.: 28888

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031J9

COC No.:

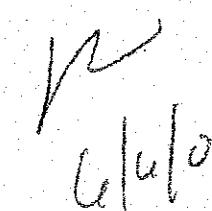
Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 5116487	RICHRC5078				Work Order: G85KD1AA		Report DB ID: 9G85KD10					
U-234	1.57E-01		2.2E-02	3.4E-02	7.80E-03 pCi/g		84%	(20.1)	5/14/05 10:33 p		2.02	ALP1
					2.92E-03	2.00E-02		(9.3)		G		
U-235	6.84E-03 U.J		5.8E-03	6.1E-03	7.80E-03 pCi/g		84%	0.88	5/14/05 10:33 p		2.02	ALP1
					2.92E-03	2.00E-02		(2.2)		G		
U-238	2.72E-01		2.8E-02	5.2E-02	6.73E-03 pCi/g		84%	(40.4)	5/14/05 10:33 p		2.02	ALP1
					2.38E-03	2.00E-02		(10.5)		G		

Ratio U-234/238 = 0.6

No. of Results: 3 Comments:



6/14/05

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total.Uncert or gamma scan software did not identify the nuclide.

J5D250202-1

J031J9

FORM I
SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland

Lot-Sample No.: J5D250202-3

Client Sample ID: J031K0

SDG: W04625A

Report No.: 28888

COC No.:

Collection Date: 4/20/2005 11:15:00 AM

Received Date: 4/25/2005 11:40:00 AM

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Count	Total	MDC MDA	Rpt Unit,	Yield	Rst/MDC,	Analysis,	Total Sa	Aliquot	Primary
		Qual	Error (2 s)	Action Lev	Lc	CRDL(RL)	Rst/TotUncert	Prep Date	Size	Size	Detector
Batch: 5116487	RICHRC5079			Work Order: G85KF1AA		Report DB ID: 9G85KF10					
U-234	6.69E-02	1.5E-02	1.9E-02	1.22E-02	pCi/g	89%	(5.5)	5/14/05 10:34 p		2.04	ALP4
U-235	2.65E-04	U <i>J</i>	3.6E-03	3.9E-03	pCi/g	89%	0.04	5/14/05 10:34 p		2.04	ALP4
U-238	1.00E-01	1.8E-02	2.4E-02	1.17E-02	pCi/g	89%	(8.6)	5/14/05 10:34 p		2.04	ALP4
				4.94E-03		2.00E-02	(8.4)				G

Ratio U-234/238 = 0.7

No. of Results: 3 Comments:

STL Richland Sample

P
6/6/05

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625A

Collection Date: 4/20/2005 12:45:00 PM

Lot-Sample No.: J5D250202-4

Report No.: 28888

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031K2

COC No.:

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (\pm s)	Total Uncert(\pm s)	MDC MDA	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116487	RICHRC5079				Work Order: G85KH1AA		Report DB ID: 9G85KH10					
U-234	3.96E-02		1.1E-02	1.4E-02	7.05E-03	pCi/g	89%	(5.6)	5/14/05 10:34 p		2.0	ALPS
					2.64E-03		2.00E-02	(5.6)			G	
U-235	2.20E-03	U	3.7E-03	4.1E-03	6.08E-03	pCi/g	89%	0.36	5/14/05 10:34 p		2.0	ALP5
					2.15E-03		2.00E-02	(1.1)			G	
U-238	9.96E-02		1.7E-02	2.3E-02	9.23E-03	pCi/g	89%	(10.8)	5/14/05 10:34 p		2.0	ALP5
					3.73E-03		2.00E-02	(8.6)			G	

Ratio U-234/238 = 0.4

No. of Results: 3 Comments:

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STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rplSTLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.
 Vd13 A97

FORM I
SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland

SDG: W04625A

Collection Date: 4/20/2005 1:15:00 PM

Lot-Sample No.: J5D250202-5

Report No. : 28888

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031K4

COC No. 2

Matrix: VEGETATION

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncer(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116487	RICHRC5078			Work Order: G85KJ1AA			Report DB ID: 9G85KJ10					
U-234	9.37E-02		1.6E-02	2.3E-02	4.80E-03 pCi/g		92%	(19.5)	5/14/05 10:35 p		2.0	ALP6
					1.52E-03	2.00E-02	(8.2)				G	
U-235	3.50E-03	U	4.1E-03	4.5E-03	6.08E-03 pCi/g		92%	0.58	5/14/05 10:35 p		2.0	ALP6
					2.15E-03	2.00E-02	(1.6)				G	
U-238	2.33E-01		2.5E-02	4.5E-02	6.06E-03 pCi/g		92%	(38.5)	5/14/05 10:35 p		2.0	ALP6
					2.15E-03	2.00E-02	(10.4)				G	

Ratio U-234/238 = 0.4

No. of Results: 3 Comments:

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STL Richland
p1STLRchSample
13 A97

FORM I
SAMPLE RESULTS

Date: 22-Jun-05

Lab Name: STL Richland
Lot-Sample No.: J5F100312-7
Client Sample ID: J031H9

SDG: W04625C
Report No.: 29214
COC No.:

Collection Date: 4/19/2005 1:00:00 PM
Received Date: 6/10/2005 12:00:00 PM
Matrix: SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5161502	GAMMA_GS				Work Order: HDEE31AA		Report DB ID: 9HDEE310					
AM-241	2.02E-02	U	J	1.2E-01	1.2E-01	2.04E-01 pCi/g		0.1	6/15/05 08:25 a		74.6	GER11\$1
CO-60	-2.27E-02	U	J	2.9E-02	2.9E-02	4.75E-02 pCi/g		0.33		g		
CS-137	2.66E-02	U		6.2E-02	6.2E-02	4.24E-02 pCi/g		-0.48	6/15/05 08:25 a		74.6	GER11\$1
EU-152	1.16E-02	U	J	6.2E-02	6.2E-02	1.07E-01 pCi/g		0.63	6/15/05 08:25 a		74.6	GER11\$1
EU-154	-8.33E-02	U		9.0E-02	9.0E-02	1.45E-01 pCi/g		0.38		g		
EU-155	-4.13E-02	U		5.6E-02	5.6E-02	9.20E-02 pCi/g		-0.58	6/15/05 08:25 a		74.6	GER11\$1
RA-226	1.76E-01	U		6.7E-02	6.7E-02	9.71E-02 pCi/g		0.11	6/15/05 08:25 a		74.6	GER11\$1
RA-228	1.26E-01	U		9.2E-02	9.2E-02	1.70E-01 pCi/g		0.74	6/15/05 08:25 a		74.6	GER11\$1
TH-228	1.15E-01	U		7.4E-02	7.4E-02	1.34E-01 pCi/g		0.86	6/15/05 08:25 a		74.6	GER11\$1
TH-232	1.24E-01	U		1.3E-01	1.3E-01	2.38E-01 pCi/g		0.52	6/15/05 08:25 a		74.6	GER11\$1

No. of Results: 10 Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rpt@STLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
 V013 A97

K 6/25/05

FORM I

Date: 22-Jun-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625C

Collection Date: 4/19/2005 11:00:00 AM

Lot-Sample No.: J5F100312-8

Report No.: 29214

Received Date: 6/10/2005 12:00:00 PM

Client Sample ID: J031J0

COC No.:

Matrix: SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allot Size	Primary Detector
Batch: 5161502	GAMMA_GS				Work Order: HDEE41AA		Report DB ID: 9HDEE410					
AM-241	<u>4.47E-02</u>	U J	6.5E-02	6.5E-02	1.02E-01	pCi/g		0.44 (1.4)	6/16/05 12:54 p		14.1 9	GER5\$1
CO-60	<u>-5.78E-03</u>	U J	7.7E-02	7.7E-02	1.35E-01	pCi/g		-0.04 5.00E-02	6/16/05 12:54 p		14.1 9	GER5\$1
CS-137	<u>-2.60E-02</u>	U	6.5E-02	6.5E-02	1.11E-01	pCi/g		-0.23 1.00E-01	6/16/05 12:54 p		14.1 9	GER5\$1
EU-152	<u>-2.37E-02</u>	U J	1.7E-01	1.7E-01	2.78E-01	pCi/g		-0.09 1.00E-01	6/16/05 12:54 p		14.1 9	GER5\$1
EU-154	<u>1.22E-01</u>	U	2.3E-01	2.3E-01	4.10E-01	pCi/g		0.3 1.00E-01	6/16/05 12:54 p		14.1 9	GER5\$1
EU-155	<u>-1.93E-02</u>	U	1.1E-01	1.1E-01	1.86E-01	pCi/g		-0.1 1.00E-01	6/16/05 12:54 p		14.1 9	GER5\$1
RA-226	<u>-3.86E-02</u>	U	2.7E-01	2.7E-01	2.59E-01	pCi/g		-0.15 -0.29	6/16/05 12:54 p		14.1 9	GER5\$1
RA-228	<u>1.50E-01</u>	U	5.1E-01	5.1E-01	5.57E-01	pCi/g		0.27 0.58	6/16/05 12:54 p	V 4/27/05	14.1 9	GER5\$1
TH-228	<u>1.76E-01</u>	U	4.1E-01	4.1E-01	3.16E-01	pCi/g		0.56 0.86	6/16/05 12:54 p		14.1 9	GER5\$1
TH-232	<u>-1.83E-01</u>	U	5.4E-01	5.4E-01	6.34E-01	pCi/g		-0.29 -0.68	6/16/05 12:54 p		14.1 9	GER5\$1

No. of Results: 10 Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

rpt&TLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

V4T3 A97

STL Richland Sample Results Report

FORM I

Date: 22-Jun-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625C

Collection Date: 4/19/2005 2:00:00 PM

Lot-Sample No.: J5F100312-9

Report No.: 29214

Received Date: 6/10/2005 12:00:00 PM

Client Sample ID: J031J2

COC No.:

Matrix: SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncrt	Analysis, Prep Date	Total Sa Size	Alliquot Size	Primary Detector	
Batch: 5161502	GAMMA_GS				Work Order: HDEE81AA		Report DB ID: 8HDEE810						
AM-241	3.04E-02	U	J	8.2E-02	8.2E-02	1.40E-01 pCi/g		0.22	6/16/05 12:54 p		16.9	GER6\$1	
CO-60	2.08E-02	U	J	6.6E-02	6.6E-02	1.16E-01 pCi/g		0.74			9		
CS-137	7.68E-02	U		5.5E-02	5.5E-02	9.54E-02 pCi/g		0.18	6/16/05 12:54 p		16.9	GER6\$1	
EU-152	2.01E-02	U	J	1.3E-01	1.3E-01	2.16E-01 pCi/g		5.00E-02	0.63		9		
EU-154	-3.41E-02	U		1.9E-01	1.9E-01	3.28E-01 pCi/g		1.00E-01	0.09	6/16/05 12:54 p		16.9	GER6\$1
EU-155	2.78E-02	U		8.6E-02	8.6E-02	1.46E-01 pCi/g		1.00E-01	0.32		9		
RA-226	5.05E-02	U		2.1E-01	2.1E-01	2.20E-01 pCi/g		0.23	6/16/05 12:54 p		16.9	GER6\$1	
RA-228	9.95E-02	U		4.7E-01	4.7E-01	4.45E-01 pCi/g		0.49			9		
TH-228	1.42E-02	U		3.1E-01	3.1E-01	2.60E-01 pCi/g		0.22	6/16/05 12:54 p		16.9	GER6\$1	
TH-232	1.48E-02	U	J	1.3E-01	1.3E-01	4.91E-01 pCi/g		0.43	0.05	6/16/05 12:54 p		16.9	GER6\$1
								0.09	0.03	6/16/05 12:54 p		9	
								0.23			16.9		

No. of Results: 10 Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rpt6TLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.
 V213 A97

FORM I

Date: 22-Jun-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625C

Collection Date: 4/19/2005 2:10:00 PM

Lot-Sample No.: J5F100312-10

Report No.: 29214

Received Date: 6/10/2005 12:00:00 PM

Client Sample ID: J031J4

COC No.:

Matrix: SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncrt	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector	
Batch: 5161502	GAMMA_GS				Work Order: HDEE91AA		Report DB ID: 9HDEE910						
AM-241	-2.75E-02	U	J	2.1E-01	2.1E-01	3.44E-01 pCi/g		-0.08	6/16/05 12:55 p		11.7	GER11\$1	
CO-60	1.97E-02	U	J	6.8E-02	6.8E-02	1.20E-01 pCi/g		-0.27			9		
CS-137	8.01E-04	U		1.7E-01	1.7E-01	8.83E-02 pCi/g		5.00E-02	0.16	6/16/05 12:55 p		11.7	GER11\$1
EU-152	4.34E-02	U	J	1.3E-01	1.3E-01	2.18E-01 pCi/g		1.00E-01	0.01	6/16/05 12:55 p		9	
EU-154	5.64E-02	U		2.0E-01	2.0E-01	3.45E-01 pCi/g		1.00E-01	0.16	6/16/05 12:55 p		11.7	GER11\$1
EU-156	-2.10E-02	U		1.1E-01	1.1E-01	1.89E-01 pCi/g		1.00E-01	-0.11	6/16/05 12:55 p		11.7	GER11\$1
RA-226	1.34E-01	U		1.0E-01	1.0E-01	1.81E-01 pCi/g		1.00E-01	0.74	6/16/05 12:55 p		11.7	GER11\$1
RA-228	3.03E-01	U		2.4E-01	2.4E-01	4.24E-01 pCi/g			(2.6)			9	
TH-228	2.99E-01	U		2.1E-01	2.1E-01	3.66E-01 pCi/g			0.71	6/16/05 12:55 p		11.7	GER11\$1
TH-232	3.39E-02	U	J	2.5E-01	2.5E-01	4.23E-01 pCi/g			(2.6)			9	
									0.08	6/16/05 12:55 p		11.7	GER11\$1
									0.28			9	

No. of Results: 10 Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

rp:STLRchSample
V4.13 A97

FORM I
SAMPLE RESULTS

Date: 22-Jun-05

Lab Name: STL Richland

SDG: W04625C

Collection Date: 4/20/2005 10:00:00 AM

Lot-Sample No.: J5F100312-2

Report No.: 29214

Received Date: 6/10/2005 12:00:00 PM

Client Sample ID: J031J6

COG No.:

Matrix: SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5161502	GAMMA_GS				Work Order: HDEDGP1AA		Report DB ID: 9HDEDGP10					
AM-241	3.73E-02	U	5	9.1E-02	9.1E-02	1.52E-01 pCi/g		0.24	6/13/05 12:51 p		15.3	GER6\$1
								0.82			g	
CO-60	2.55E-02	U	5	7.0E-02	7.0E-02	1.24E-01 pCi/g		0.21	6/13/05 12:51 p		15.3	GER6\$1
								5.00E-02			g	
CS-137	1.33E-02	U		6.2E-02	6.2E-02	1.04E-01 pCi/g		0.13	6/13/05 12:51 p		15.3	GER6\$1
								1.00E-01			g	
EU-152	2.82E-02	U	5	1.4E-01	1.4E-01	2.31E-01 pCi/g		0.13	6/13/05 12:51 p		15.3	GER6\$1
								1.00E-01			g	
EU-154	3.51E-02	U		2.2E-01	2.2E-01	3.81E-01 pCi/g		0.09	6/13/05 12:51 p		15.3	GER6\$1
								1.00E-01			g	
EU-155	4.57E-03	U		9.8E-02	9.8E-02	1.63E-01 pCi/g		0.03	6/13/05 12:51 p		15.3	GER6\$1
								1.00E-01			g	
RA-226	-1.40E-01	U		1.8E-01	1.8E-01	2.26E-01 pCi/g		-0.62	6/13/05 12:51 p		15.3	GER6\$1
								-(1.6)			g	
RA-228	-2.76E-01	U		4.5E-01	4.5E-01	4.65E-01 pCi/g		-0.59	6/13/05 12:51 p		15.3	GER6\$1
								-(1.2)			g	
TH-228	3.21E-02	U		3.3E-01	3.3E-01	3.26E-01 pCi/g		0.1	6/13/05 12:51 p		15.3	GER6\$1
								0.2			g	
TH-232	4.55E-01	U		3.0E-01	3.0E-01	5.29E-01 pCi/g		0.86	6/13/05 12:51 p		15.3	GER6\$1
								(3.)			g	

No. of Results: 10 Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
 V13 A97

FORM I
SAMPLE RESULTS

Date: 22-Jun-05

Lab Name: STL Richland

SDG: W04625C

Collection Date: 4/20/2005 9:00:00 AM

Lot-Sample No.: J5F100312-1

Report No.: 29214

Received Date: 6/10/2005 12:00:00 PM

Client Sample ID: J031J9

COC No.:

Matrix: SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 5161502 AM-241	GAMMA_GS 2.52E-02	U	5	1.1E-01	Work Order: HDEC81AA	Report DB ID: 9HDEC610						
					1.82E-01	pCi/g	0.14	6/14/05 11:37 a		81.3	GER11\$1	
							0.48			g		
CO-60	9.70E-03	U	5	2.5E-02	2.5E-02	4.54E-02 pCi/g	0.21	6/14/05 11:37 a		81.3	GER11\$1	
							5.00E-02	0.77		g		
CS-137	7.75E-02			6.4E-02	6.4E-02	3.73E-02 pCi/g	(2.1)	6/14/05 11:37 a		81.3	GER11\$1	
							1.00E-01	(2.4)		g		
EU-152	1.07E-01	U	5	6.2E-02	6.2E-02	1.11E-01 pCi/g	0.97	6/14/05 11:37 a		81.3	GER11\$1	
							1.00E-01	(3.5)		g		
EU-154	-8.85E-03	U		8.2E-02	8.2E-02	1.41E-01 pCi/g	-0.06	6/14/05 11:37 a		81.3	GER11\$1	
							1.00E-01	-0.22		g		
EU-156	1.93E-02	U		4.9E-02	4.9E-02	8.64E-02 pCi/g	0.22	6/14/05 11:37 a		81.3	GER11\$1	
							1.00E-01	0.79		g		
RA-226	2.44E-01	U		9.1E-02	9.1E-02	9.84E-02 pCi/g	(2.5)	6/14/05 11:37 a		81.3	GER11\$1	
							(5.3)			g		
RA-228	1.23E-01	U		9.0E-02	9.0E-02	1.66E-01 pCi/g	0.74	6/14/05 11:37 a		81.3	GER11\$1	
							(2.7)			g		
TH-220	1.02E-01	U		6.8E-02	6.8E-02	1.23E-01 pCi/g	0.82	6/14/05 11:37 a		81.3	GER11\$1	
							(3.1)			g		
TH-232	9.68E-02	U		1.2E-01	1.2E-01	2.06E-01 pCi/g	0.47	6/14/05 11:37 a		81.3	GER11\$1	
							(1.7)			g		

No. of Results: 10 Comments:

STL Richland
rptSTLRchSample
V4.13 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

Date: 22-Jun-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625C

Collection Date: 4/20/2005 11:15:00 AM

Lot-Sample No.: J5F100312-3

Report No.: 29214

Received Date: 6/10/2005 12:00:00 PM

Client Sample ID: J031K0

COC No.:

Matrix: SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5161502 AM-241	GAMMA_GS 7.97E-02	U <i>J</i>	9.2E-02	9.2E-02	1.57E-01	pCi/g		0.51 (1.7)	6/14/05 11:38 a	14.9	9	GER6\$1
CO-60	5.57E-02	U <i>J</i>	7.2E-02	7.2E-02	1.29E-01	pCi/g		0.43 (1.6)	6/14/05 11:38 a	14.9	9	GER6\$1
CS-137	1.19E-03	U	5.9E-02	5.9E-02	1.01E-01	pCi/g		0.01 1.00E-01	6/14/05 11:38 a	14.9	9	GER6\$1
EU-152	-2.15E-02	U <i>J</i>	1.4E-01	1.4E-01	2.31E-01	pCi/g		-0.09 1.00E-01	6/14/05 11:38 a	14.9	9	GER6\$1
EU-154	-1.59E-01	U	2.0E-01	2.0E-01	3.23E-01	pCi/g		-0.49 1.00E-01	6/14/05 11:38 a	14.9	9	GER6\$1
EU-155	2.05E-02	U	9.8E-02	9.8E-02	1.65E-01	pCi/g		0.12 1.00E-01	6/14/05 11:38 a	14.9	9	GER6\$1
RA-226	-1.63E-02	U	1.8E-01	1.8E-01	2.43E-01	pCi/g		-0.07 -0.18	6/14/05 11:38 a	14.9	9	GER6\$1
RA-228	-6.65E-02	U	4.6E-01	4.6E-01	4.88E-01	pCi/g		-0.14 -0.29	6/14/05 11:38 a	14.9	9	GER6\$1
TH-228	-1.42E-01	U	2.7E-01	2.7E-01	3.33E-01	pCi/g		-0.43 -(1.)	6/14/05 11:38 a	14.9	9	GER6\$1
TH-232	3.05E-01	U	3.0E-01	3.0E-01	5.27E-01	pCi/g		0.58 (2.)	6/14/05 11:38 a	14.9	9	GER6\$1

No. of Results: 10 Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

rp6TLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

V213 A97

FORM I

Date: 22-Jun-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625C

Collection Date: 4/20/2005 12:45:00 PM

Lot-Sample No.: J5F100312-4

Report No.: 29214

Received Date: 6/10/2005 12:00:00 PM

Client Sample ID: J031K2

COC No.:

Matrix: SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector	
Batch: 5161502	GAMMA_GS				Work Order: HDEDW1AA		Report DB ID: 9HDEDW10						
AM-241	-1.43E-02	U	5	8.3E-02	8.3E-02	1.41E-01 pCi/g		-0.1	6/15/05 12:10 p		15.4	GER6\$1	
CO-60	-3.64E-02	U	5	6.9E-02	6.9E-02	1.16E-01 pCi/g		-0.35			9		
CS-137	4.17E-02	U		5.7E-02	5.7E-02	1.01E-01 pCi/g		-0.31	6/15/05 12:10 p		15.4	GER6\$1	
EU-152	1.29E-02	U	5	1.3E-01	1.3E-01	2.26E-01 pCi/g		5.00E-02	(-1.1)		9		
EU-154	1.62E-01	U		2.2E-01	2.2E-01	3.87E-01 pCi/g		1.00E-01	0.41	6/15/05 12:10 p		15.4	GER6\$1
EU-155	2.47E-02	U		8.7E-02	8.7E-02	1.49E-01 pCi/g		1.00E-01	(1.5)		9		
RA-226	-1.10E-01	U		1.8E-01	1.8E-01	2.32E-01 pCi/g		1.00E-01	0.06	6/15/05 12:10 p		15.4	GER6\$1
RA-228	-8.01E-02	U		4.5E-01	4.5E-01	4.84E-01 pCi/g		1.00E-01	0.19		9		
TH-228	-2.32E-01	U		2.6E-01	2.6E-01	3.15E-01 pCi/g		1.00E-01	0.42	6/15/05 12:10 p		15.4	GER6\$1
TH-232	5.34E-01	U		3.0E-01	3.0E-01	5.19E-01 pCi/g		1.00E-01	0.17	6/15/05 12:10 p		15.4	GER6\$1

No. of Results: 10 Comments:

STL Richland
rp6TLRchSample
V4-13 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

STL

FORM I

Date: 22-Jun-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625C

Collection Date: 4/20/2005 1:15:00 PM

Lot-Sample No.: J5F100312-5

Report No.: 29214

Received Date: 6/10/2005 12:00:00 PM

Client Sample ID: J031K4

COC No.:

Matrix: SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allot Size	Primary Detector
Batch: 5161502	GAMMA_GS				Work Order: HDED071AA		Report DB ID: 9HDED710					
AM-241	1.13E-02	U <i>J</i>	9.2E-02	9.2E-02	1.56E-01	pCi/g		0.07	6/14/05 09:42 p		95.5	GER11\$1
								0.25			9	
CO-60	5.38E-03	U <i>J</i>	2.4E-02	2.4E-02	4.32E-02	pCi/g		0.12	6/14/05 09:42 p		95.5	GER11\$1
							5.00E-02	0.44			9	
CS-137	1.72E-02	U	4.9E-02	4.9E-02	3.68E-02	pCi/g		0.47	6/14/05 09:42 p		95.5	GER11\$1
							1.00E-01	0.7			9	
EU-152	2.78E-02	U <i>J</i>	4.9E-02	4.9E-02	8.70E-02	pCi/g		0.32	6/14/05 09:42 p		95.5	GER11\$1
							1.00E-01	(1.1)			9	
EU-154	-4.66E-04	U	6.9E-02	6.9E-02	1.19E-01	pCi/g		0.	6/14/05 09:42 p	<i>K</i>	95.5	GER11\$1
							1.00E-01	-0.01			9	
EU-155	2.06E-02	U	4.6E-02	4.6E-02	8.15E-02	pCi/g		0.25	6/14/05 09:42 p	<i>U238</i>	95.5	GER11\$1
							1.00E-01	0.89			9	
RA-226	1.39E-01	U	5.9E-02	5.9E-02	8.06E-02	pCi/g		(1.7)	6/14/05 09:42 p		95.5	GER11\$1
								(4.7)			9	
RA-228	7.74E-02	U	7.9E-02	7.9E-02	1.43E-01	pCi/g		0.54	6/14/05 09:42 p		95.5	GER11\$1
								(2.)			9	
TH-228	5.88E-02	U	5.7E-02	5.7E-02	1.03E-01	pCi/g		0.57	6/14/05 09:42 p		95.5	GER11\$1
								(2.)			9	
TH-232	2.18E-02	U <i>V</i>	1.0E-01	1.0E-01	1.81E-01	pCi/g		0.12	6/14/05 09:42 p		95.5	GER11\$1
								0.42			9	

No. of Results: 10 Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rpt@TLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
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FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625B

Collection Date: 4/19/2005 1:00:00 PM

Lot-Sample No.: J5D250204-6

Report No.: 28889

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031H8

COC No.:

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Count	Total	MDC MDA,	Rpt Unit,	Yield	Rst/MDC,	Analysis,	Total Sa	Allquot	Primary
		Qual	Uncert(2 s)	Action Lev	Lc	CRDL(RL)	Rst/TotUncert	Prep Date	Size	Size	Detector
Batch: S116489	SRISO_SEP_PRECIP_GPC			Work Order: G86HN1AA		Report DB ID: 9G86HN10					
STRONTIUM	3.78E-01	1.4E-01	1.7E-01	2.37E-01	pCi/g	35%	(1.6)	5/11/05 06:37 a	6.04	G	GPC27B
					1.10E-01	1.00E+00	(4.4)				

No. of Results: 1 Comments:

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STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRchSample U Qual - Analyzed for, but the result is less than the Mdc/MDA|Total Uncert or gamma scan software did not identify the nuclide.
 V613 A97

FORM I

SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland
Lot-Sample No.: JSD250204-7
Client Sample ID: J031H9

SDG: W04625B
Report No.: 28889
COC No.:

Collection Date: 4/19/2005 1:00:00 PM
Received Date: 4/25/2005 11:40:00 AM
Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual.	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_PRECIP_GPC			Work Order: G86HV1AA			Report DB ID: 9G86HV10					
STRONIUM	2.22E-01		8.9E-02	1.1E-01	1.53E-01	pCi/g	54%	(1.5)	5/11/05 06:37 a	6.0	G	GPC27C
					7.06E-02	1.00E+00	(4.2)					

No. of Results: 11 Comments:

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MDC|MDA,Lc - Detection Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625B

Collection Date: 4/19/2005 11:00:00 AM

Lot-Sample No.: J5D250204-8

Report No.: 28889

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031J0

COC No.:

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_PRECIP_GPC				Work Order: G86HX1AA		Report DB ID: 9G86HX10					
STRONTIUM	1.49E-01		6.2E-02	7.3E-02	1.09E-01	pCi/g	83%	(1.4)	5/11/05 06:37 a	6.02	GPC27D	G
							5.07E-02	1.00E+00	(4.1)			

No. of Results: 1 Comments:

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6/6/05

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rpiSTLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
 Ver 3 A97

FORM I
SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland
Lot-Sample No.: J5D250204-9
Client Sample ID: J031J2

SDG: W04625B
Report No.: 28889
COC No.:

Collection Date: 4/19/2005 2:00:00 PM
Received Date: 4/25/2005 11:40:00 AM
Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_FRECIP_GPC				Work Order: G86H21AA			Report DB ID: 9G86H210				
STRONTIUM	3.94E-01	1.0E-01	1.4E-01	1.54E-01	pCi/g		61%	(2.6)	5/11/05 06:36 a	8.04	G	GPC28A
				7.16E-02		1.00E+00	(5.4)					

No. of Results: 1 Comments:

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5/11/05

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland
 Lot-Sample No.: J5D250204-10
 Client Sample ID: J031J4

SDG: W04625B
 Report No.: 28889
 COC No.:

Collection Date: 4/19/2005 2:10:00 PM
 Received Date: 4/25/2005 11:40:00 AM
 Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_PRECIP_GPC				Work Order: G86H31AA		Report DB ID: 9G86H310					
STRONIUM	1.46E-01	U	9.8E-02	1.0E-01	1.94E-01	pCi/g	43%	0.75	5/11/05 06:36 a	6.06	G	GPC28B
						9.01E-02	1.00E+00	(2.8)				

No. of Results: 1 Comments:

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4/11/05

FORM I
SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland

SDG: W04625B

Collection Date: 4/20/2005 9:00:00 AM

Lot-Sample No.: J5D250204-12

Report No.: 28889

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031J6

COC No.:

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncer(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_PRECIP_GPC				Work Order: G88DX1AA		Report DB ID: 9G88DX10					
STRONIUM	1.98E-01	U	1.1E-01	1.2E-01	2.00E-01	pCi/g	44%	0.99	5/11/05 07:31 a.	6.03	GPC26B	
					9.32E-02		1.00E+00	(3.4)			G	

No. of Results: 1 Comments:

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JUL 05

FORM I
SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland
Lot-Sample No.: J5D250204-11
Client Sample ID: J031J8

SDG: W04625B
Report No.: 28889
COC No.:

Collection Date: 4/20/2005 9:00:00 AM
Received Date: 4/26/2005 11:40:00 AM
Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_PRECIP_GPC				Work Order: G86JE1AA		Report DB ID: 9086JE10					
STRONTIUM	2.59E-01	7.8E-02		1.0E-01	1.26E-01	pCi/g	76%	(2.1)	5/11/05 06:36 a	6.0	G	GPC28C
					6.86E-02		1.00E+00	(5.)				

No. of Results: 1 Comments:

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5/10/05

FORM I

Date: 23-May-05

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04625B

Collection Date: 4/20/2005 9:00:00 AM

Lot-Sample No.: JSD250204-1

Report No.: 28889

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031J9

COC No.:

Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error(2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116489 STRONIUM	SRISO_SEP_PRECIP_GPC 4.01E-01	9.6E-02		1.4E-01	1.43E-01	pCi/g	71%	(2.8)	5/11/05 06:37 a	6.03	G	GPC26A
					6.69E-02		1.00E+00	(5.6)				

No. of Results: 1 Comments:

040000

FORM I
SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland
Lot-Sample No.: J5D250204-3
Client Sample ID: J031K0

SDG: W04625B
Report No.: 28889
COC No.:

Collection Date: 4/20/2005 11:15:00 AM
Received Date: 4/25/2005 11:40:00 AM
Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_PRECIP_GPC				Work Order: G86HC1AA			Report DB ID: 9G86HC10				
STRONIUM	1.77E-01	U	9.4E-02	1.0E-01	1.79E-01	pCi/g	50%	0.99	5/11/05 06:37 a	6.02	G	GPC26B
							8.33E-02	1.00E+00	(3.4)			

No. of Results: 1 Comments:

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FORM I
SAMPLE RESULTS

Date: 23-May-05

Lab Name: STL Richland
Lot-Sample No.: JSD250204-4
Client Sample ID: J031K2

SDG: W04625B
Report No.: 28889
COC No.:

Collection Date: 4/20/2005 12:45:00 PM
Received Date: 4/25/2005 11:40:00 AM
Matrix: VEGETATIO

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_PRECIP_GPC				Work Order: G86HJ1AA		Report DB ID: 9G86HJ10					
STRONIUM	1.35E-01	U	7.2E-02	8.0E-02	1.35E-01	pCi/g	65%	0.99	5/11/05 06:37 a	6.05	G	GPC26D

No. of Results: 1 Comments:

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4/6/05

STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

rgt(STLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
V4.13 A97

FORM I

SAMPLE RESULTS

Date: 23-May-05

Lab Name: STI Richland

SDG: W04625B

Collection Date: 4/20/2005 1:15:00 PM

Lot-Sample No.: J5D250204-5

Report No. : 28889

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031K4

COC No. :

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_PRECIP_GPC			Work Order: G86HK1AA		Report DB ID: 9G86HK10						
STRONTIUM	2.51E-01	1.0E-01	1.2E-01	1.85E-01	pCi/g		47%	(1.4)	5/11/05 06:37 a	6.01	G	GPC27A

No. of Results: 11 Comments:

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000044

**SEVERN
TRENT**

STL

Certificate of Analysis

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

June 22, 2005

Attention: Joan Kessner

STL Richland
2800 George Washington Way
Richland, WA 99354

Tel: 509 375 3131 Fax: 509 375 5590
www.stl-inc.com

SAF Number	:	D05-002
Date SDG Closed	:	April 25, 2005
Number of Samples	:	Eleven (11)
Sample Type	:	Other Solid
SDG Number	:	W04625C
Data Deliverable	:	21-Day / Summary

CASE NARRATIVE

I. Introduction

On June 6, 2005, a request was received to perform a recount of the gamma analysis for the eleven soil samples. Upon receipt, the samples were assigned the STL identification numbers as described on the cover page of the Analytical Data Package report form. These samples were assigned to Lot Number J5F100312.

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was:

Gamma Spectroscopy
Gamma Spec by method RICH-RC-5017

000045

Bechtel Hanford, Inc.
June 22, 2005
Page 2

IV. Quality Control

The analytical results for each analysis performed under SDG W04625C includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gamma Spectroscopy

Gamma Spec by method RICH-RC-5017:

Samples J031H8 and J031J8 were not included in the analytical batch. There was insufficient sample volume for reanalysis. The achieved MDAs are greater than the CRDL due to limited sample volumes. Except as noted, the LCS, batch blank, sample and sample duplicate (J031J9) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Martha Jo Cahill for Becky Warrington
Becky Warrington
Project Manager

000046

Certificate of Analysis

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

May 20, 2005

Attention: Joan Kessner

SAF Number	:	D05-002
Date SDG Closed	:	April 25, 2005
Number of Samples	:	Eleven (11)
Sample Type	:	Other Solid
SDG Number	:	W04625A
Data Deliverable	:	21-Day / Summary

CASE NARRATIVE

I. Introduction

On April 25, 2005, eleven other solid samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the STLR identification numbers as described on the cover page of the Analytical Data Package report form. These samples were assigned to Lot Number JSD250202.

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was:

Alpha Spectroscopy
Uranium-234, -235, -238 by method RICH-RC-579

000047

Bechtel Hanford, Inc.

May 20, 2005

Page 2

IV. Quality Control

The analytical results for each analysis performed under SDG W04625A includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gamma Spectroscopy

Uranium-234, -235, -238 by method RICH-RC-5079:

The LCS, batch blank, sample and sample duplicate (J031J6) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Becky Warrington
for *Becky Warrington*
Becky Warrington
Project Manager

000048

Certificate of Analysis

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

May 20, 2005

Attention: Joan Kessner

SAF Number	:	D05-002
Date SDG Closed	:	April 25, 2005
Number of Samples	:	Eleven (11)
Sample Type	:	Other Solid
SDG Number	:	W04625B
Data Deliverable	:	21-Day / Summary

CASE NARRATIVE

I. Introduction

On April 25, 2005, eleven other solid samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the STLR identification numbers as described on the cover page of the Analytical Data Package report form. These samples were assigned to Lot Number J5D250204.

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was:

Gas Proportional Counting
Total Strontium by method RICH-RC-5006

000049

Bechtel Hanford, Inc.
May 20, 2005
Page 2

IV. Quality Control

The analytical results for each analysis performed under SDG W04625B includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gas Proportional Counting

Total Strontium by method RICH-RC-5006:

The LCS, batch blank, sample and sample duplicate (J031K0) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

for Becky Warrington
Becky Warrington
Project Manager

000050

Appendix 5

Data Validation Supporting Documentation

000054

APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	RCBRA		DATA PACKAGE: WO 4625		
VALIDATOR:	TCI	LAB: Severn Trent		DATE: 6/5/08	
			SDG: WO4623		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-89	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Kadium-232	Tridium			
SAMPLES/MATRIX					
J031H8 J031H9 J031J0 J031J2 J031J4 J031J6 J031J8 J031J9 J031K0 J031K2 J031K4					

1. Completeness..... N/A

Technical verification forms present?..... Yes No N/A

Comments:

2. Initial Calibration (Levels D, E) N/A

Instruments/detectors calibrated?..... Yes No N/A

Initial calibration acceptable?..... Yes No N/A

Standards NIST traceable?..... Yes No N/A

Standards Expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments:

3. Continuing Calibration (Levels D, E)

N/A

Calibration checked within required frequency? Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

4. Background Counts (Levels D, E)

N/A

Background Counts checked within required frequency? Yes No N/A

Background Counts acceptable? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

000056

5. Blanks (Levels B, C, D, E) N/A

Method blank analyzed within required frequency? Yes No N/A

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

Field blank(s) analyzed? Yes No N/A

Field blank results acceptable? Yes No N/A

Analytes detected in field blank(s)? Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: No FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) N/A

LCS/BSS analyzed within required frequency? Yes No N/A

LCS/BSS recoveries acceptable? Yes No N/A

LCS/BSS traceable? (Levels D,E) Yes No N/A

LCS/BSS expired? (Levels D,E) Yes No N/A

LCS/BSS levels correct? (Levels D,E) Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: Stream 6920 11/8 all day

U-235 - No LCS T all

gamm spec - no Co-60 LCS T all hrs CS-137

7. Chemical Carrier Recovery (Levels C, D, E) N/A

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

Chemical carrier traceable? (Levels D, E) Yes No N/A

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1000057

Chemical carrier expired? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

Comments: _____

8. Tracer Recovery (Levels C, D, E) N/A

Tracer added? Yes No N/A

Tracer recovery acceptable? Yes No N/A

Tracer traceable? (Levels D, E) Yes No N/A

Tracer expired? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E) N/A

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

Spike source traceable? (Levels D, E) Yes No N/A

Spike source expired? Levels D, E) Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: _____

10. Duplicates (Levels C, D, E) N/A

Duplicates Analyzed at required frequency? Yes No N/A

RPD Values Acceptable? Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: _____

11. Field QC Samples (Levels C, D E) N/A

Field duplicate sample(s) analyzed? Yes No N/A

Field duplicate RPD values acceptable? Yes No N/A

Field split sample(s) analyzed? Yes No N/A

Field split RPD values acceptable? Yes No N/A

Performance audit sample(s) analyzed? Yes No N/A

Performance audit sample results acceptable? Yes No N/A

Comments: no FD, FS or PAT

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A

Comments: _____

13. Results and Detection Limits (All Levels) N/A

Results reported for all required sample analyses? Yes No N/A

Results supported in raw data? (Levels D, E) Yes No N/A

Results Acceptable? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

MDA's meet required detection limits? Yes No N/A

Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: Dashed 52 ac

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Appendix 6

Additional Documentation Requested by Client

000061

STL RICHLAND LABORATORY

FORM II
DUPLICATE RESULTS

Date: 22-Jun-05

Lab Name: STL Richland

SDG: W04625C

Collection Date: 4/20/2005 9:00:00 AM

Lot-Sample No.: J5F100312-1

Report No.: 29214

Received Date: 6/10/2005 12:00:00 PM

Client Sample ID: J031J9 DUP

COC No.:

Matrix: SOLID

Parameter		Result, Orig Rst	Count Qual	Total Error(2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5161502	GAMMA_GS					Work Order: HDEC61AC	Report DB ID: HDEC61CR			Orig Sa DB ID: 9HDEC610			
AM-241	-6.66E-03	U	5.1E-02	5.1E-02	7.51E-02	pCi/g			-0.09	6/14/05 09:56 p	81.3	GER5\$1	
	2.52E-02	U	RPD 344.2						-0.26		9		
CO-60	5.38E-02	U	4.1E-02	4.1E-02	7.82E-02	pCi/g			0.69	6/14/05 09:56 p	81.3	GER5\$1	
	9.70E-03	U	RPD 138.9						(2.6)		9		
CS-137	7.45E-02	U	4.1E-02	4.1E-02	7.49E-02	pCi/g			0.99	6/14/05 09:56 p	81.3	GER5\$1	
	7.75E-02	U	RPD 4.0						(3.6)		9		
EU-152	3.23E-02	U	9.8E-02	9.8E-02	1.71E-01	pCi/g			0.19	6/14/05 09:56 p	81.3	GER5\$1	
	1.07E-01	U	RPD 107.2						0.66		9		
EU-154	3.58E-02	U	1.1E-01	1.1E-01	2.01E-01	pCi/g			0.18	6/14/05 09:56 p	81.3	GER5\$1	
	-8.85E-03	U	RPD 331.1						0.64		9		
EU-156	2.24E-02	U	7.7E-02	7.7E-02	1.31E-01	pCi/g			0.17	6/14/05 09:56 p	81.3	GER5\$1	
	1.93E-02	U	RPD 15.0						0.58		9		
RA-226	1.42E-01	U	1.7E-01	1.7E-01	1.62E-01	pCi/g			0.87	6/14/05 09:56 p	81.3	GER5\$1	
	2.44E-01	U	RPD 52.7						(1.7)		9		
RA-228	3.33E-01	U	2.6E-01	2.6E-01	3.19E-01	pCi/g			(1.)	6/14/05 09:56 p	81.3	GER5\$1	
	1.23E-01	U	RPD 91.9						(2.5)		9		
TH-228	3.86E-02	U	1.6E-01	1.6E-01	2.29E-01	pCi/g			0.17	6/14/05 09:56 p	81.3	GER5\$1	
	1.02E-01	U	RPD 89.9						0.49		9		
TH-232	-3.11E-02	U	2.7E-01	2.7E-01	3.81E-01	pCi/g			-0.08	6/14/05 09:56 p	81.3	GER5\$1	
	9.68E-02	U	RPD 389.5						-0.23		9		

No. of Results: 10 Comments:

STL Richland RPD - Relative Percent Difference.

rpt4STLRchDupV4.1 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

30997 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II
BLANK RESULTS

Date: 22-Jun-05

Lab Name: STL Richland
Matrix: SOLID

SDG: W04625C
Report No.: 29214

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5161502	GAMMA_GS				Work Order: HDEHV1AA			Report DB ID: HDEHV1AB				
AM-241	-1.30E-02	U	3.8E-02	3.8E-02	5.62E-02	pCi/g		0.23	6/17/05 10:56 a	25.0	g	GER5\$1
								0.68				
CO-60	-8.47E-03	U	3.9E-02	3.9E-02	6.70E-02	pCi/g		-0.13	6/17/05 10:56 a	25.0	g	GER5\$1
								-0.44				
CS-137	-1.27E-03	U	3.8E-02	3.8E-02	6.50E-02	pCi/g		-0.02	6/17/05 10:56 a	25.0	g	GER5\$1
								1.00E-01				
EU-152	-1.98E-02	U	9.0E-02	9.0E-02	1.52E-01	pCi/g		-0.13	6/17/05 10:56 a	25.0	g	GER5\$1
								1.00E-01				
EU-154	-1.09E-02	U	1.1E-01	1.1E-01	1.99E-01	pCi/g		-0.05	6/17/05 10:56 a	25.0	g	GER5\$1
								1.00E-01				
EU-155	-1.87E-02	U	6.4E-02	6.4E-02	1.05E-01	pCi/g		-0.18	6/17/05 10:56 a	25.0	g	GER5\$1
								1.00E-01				
RA-226	-6.99E-02	U	1.5E-01	1.5E-01	1.42E-01	pCi/g		-0.49	6/17/05 10:56 a	25.0	g	GER5\$1
								-0.93				
RA-228	-2.32E-02	U	2.3E-01	2.3E-01	2.93E-01	pCi/g		-0.08	6/17/05 10:56 a	25.0	g	GER5\$1
								-0.2				
TH-228	1.11E-01	U	2.2E-01	2.2E-01	2.21E-01	pCi/g		0.51	6/17/05 10:56 a	25.0	g	GER5\$1
								(1.)				
TH-232	-1.87E-01	U	3.0E-01	3.0E-01	3.55E-01	pCi/g		-0.53	6/17/05 10:56 a	25.0	g	GER5\$1
								-(1.2)				

No. of Results: 10 Comments:

FORM II
LCS RESULTS

Date: 22-Jun-05

Lab Name: STL Richland

SDG: W04625C

Matrix: SOLID

Report No.: 29214

Parameter	Result	Count	Total Uncert(2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 5161502	GAMMA_GS			Work Order: HDEHV1AC	Report DB ID: HDEHV1CS							
CS-137	2.79E+00	3.4E-01	3.4E-01	3.70E-02 pCi/g			2.66E+00	5.7E-02	105%	6/20/05 11:47 a	25.0	GER11\$1
					Rec Limits:	70	130	0.0			g	

No. of Results: 1 Comments:

4900000

FORM II

Date: 23-May-05

DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W04625A

Collection Date: 4/20/2005 10:00:00 AM

Lot-Sample No.: J5D250202-2

Report No.: 28888

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031J6 DUP

COC No.:

Matrix: VEGETATIO

Parameter	Result, Org Rst	Count Qual	Total Error(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116487	RICHRC5079			Work Order: G85KE1AC	Report DB ID: G85KE1CR			Org Sa DB ID: 9G85KE10			
U-234	5.37E-02		1.4E-02	1.8E-02	1.37E-02 pCi/g	85%	(3.9)	5/14/05 10:34 p		2.03	ALP3
	5.49E-02		RPD 2.2		2.00E-02		(6.)			G	
U-235	-1.09E-03	U	4.5E-03	4.8E-03	9.62E-03 pCi/g	85%	-0.11	5/14/05 10:34 p		2.03	ALP3
	1.63E-03	U	RPD 1009.4		2.00E-02		-0.45			G	
U-238	1.30E-01		2.0E-02	2.9E-02	9.62E-03 pCi/g	85%	(13.6)	5/14/05 10:34 p		2.03	ALP3
	1.40E-01		RPD 7.3		2.00E-02		(9.1)			G	

Ratio U-234/238 = 0.4

Alpha Spec Result Sum = 1.8E-01

No. of Results: 3 Comments:

S800CS

STL Richland RPD - Relative Percent Difference.

rp1STLRchDupV4.1 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

3/29/07

FORM II
BLANK RESULTS

Date: 23-May-05

Lab Name: STL Richland

SDG: W04625A

Matrix: VEGETATION

Report No.: 28888

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116487	RICHRC5079				Work Order: G878J1AA		Report DB ID: G878J1AB					
U-234	1.74E-03	U	3.3E-03	7.2E-03	4.11E-03	pCi/g	85%	0.42	5/14/05 10:38 p		2.0	ALP71
					1.07E-03	2.00E-02		0.48			G	
U-235	-9.97E-04	U	8.2E-04	1.9E-03	5.00E-03	pCi/g	85%	-0.2	5/14/05 10:38 p		2.0	ALP71
					1.51E-03	2.00E-02		-(1.1)			G	
U-238	-1.06E-04	U	3.2E-03	3.9E-03	7.22E-03	pCi/g	85%	-0.01	5/14/05 10:38 p		2.0	ALP71
					2.62E-03	2.00E-02		-0.05			G	
Ratio U-234/238 = -18.4												

No. of Results: 3 Comments:

ORNL/DOE

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II
LCS RESULTS

Date: 23-May-05

Lab Name: STL Richland

SDG: W04625A

Matrix: VEGETATION

Report No.: 28888

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 5116487	RICHRC6079				Work Order: G878J1AC		Report DB ID: G878J1CS						
U-234	1.54E-01		2.1E-02	3.3E-02	4.74E-03 pCi/g		89%	1.40E-01	1.1E-03	110%	5/14/05 10:39 p	2.0	ALP72
U-238	1.30E-01		1.9E-02	2.9E-02	5.39E-03 pCi/g		89%	1.47E-01	1.1E-03	.89%	5/14/05 10:39 p	2.0	ALP72

No. of Results: 2 Comments:

1500000

FORM II

Date: 23-May-05

DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W04625B

Collection Date: 4/20/2005 11:15:00 AM

Lot-Sample No.: J5D250204-3

Report No.: 28889

Received Date: 4/25/2005 11:40:00 AM

Client Sample ID: J031K0 DUP

COC No.:

Matrix: VEGETATIO

Parameter	Result, Orig Rst	Count Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5116489	SRISO_SEP_PRECIP_GPC				Work Order: G86HC1AC				Report DB ID: G86HC1CR			Orig Sa DB ID: 9G86HC10
STRONTIUM	1.72E-01		8.2E-02	9.3E-02	1.49E-01	pCi/g	60%	(1.2)	5/11/05 06:37 a		6.01	GPC26C
	1.77E-01	U	RPD 2.7					1.00E+00			G	

No. of Results: 1 Comments:

00000000

STL Richland

RPD - Relative Percent Difference.

rptSTLRchDupV4.1 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

3 A97